This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (presently amended) A device comprising

one or more microneedles having at least one substantially annular channel therethrough, ~~which are formed using a microfabricated mold~~ and having a length between about 1 μm and 1 mm and a diameter between about 1 μm and 100 μm, and

a substrate to which the one or more microneedles is attached.

2. (new) The device of claim 1, wherein the length of the one or more microneedles is greater than the diameter, wherein the length is between about 30 μm and 200 μm and the diameter is between about 1 μm and 10 μm.

3. (new) The device of claim 1, wherein the length of the one or more microneedles is greater than the diameter, wherein the length is between about 100 μm and 200 μm and the diameter is between about 10 μm and 30 μm.

4. (new) The device of claim 1, wherein the length of the one or more microneedles is greater than the diameter, wherein the length is between about 100 μm and 200 μm and the diameter is between about 20 μm and 50 μm.

5. (new) The device of claim 1, wherein the length of the one or more microneedles is greater than the diameter, wherein the length is between about 300 μm and 500 μm and the diameter is between about 30 μm and 100 μm.

6. (new) The device of claim 1, wherein the diameter of the substantially annular channel is between about 3 μm and 80 μm.

7. (new) The device of claim 1, wherein the substantially annular channel extends through the entire one or more microneedles from the base to the tip.

8. (new) The device of claim 1, wherein the substantially annular channel extends and branches through the one or more microneedles.

9. (new) The device of claim 1, wherein the substantially annular channel extends through a portion of the one or more microneedles.

10. (new) The device of claim 1, wherein the one or more microneedles comprise a shaft of substantially uniform diameter.

11. (new) The device of claim 1, wherein the one or more microneedles comprise a shaft having a base end which tapers to a pointed tip end.

12. (new) The device of claim 1, wherein the one or more microneedles comprises a shaft, a portion of which has a substantially uniform diameter and a portion of which tapers to a pointed tip end.

13. (new) The device of claim 1, wherein the one or more microneedles extend at an angle from the substrate.

14. (new) The device of claim 13, wherein the angle is about 90 degrees.

15. (new) The device of claim 1, wherein the one or more microneedles are made of a material selected from metals, ceramics, semiconductors, organics, polymers and composites.

16. (new) The device of claim 1, wherein the one or more microneedles are made of pharmaceutical grade stainless steel, gold, titanium, nickel, iron, gold, tin, chromium, copper, metal alloys, silicon, and silicon dioxide.

17. (new) The device of claim 1, wherein the one or more microneedles are made of a material consisting of a metal.

18. (new) The device of claim 1, wherein the one or more microneedles include a biodegradeable polymer.

19. (new) The device of claim 18, wherein the biodegradeable polymer is selected from lactic acid and glycolic acid polylactide, polyglycolide, polylactide-co-glycolide, and copolymers with PEG, polyanhydrides, poly(ortho)esters, polyurethanes, poly(butyric acid), poly(valeric acid), and poly(lactide-co-caprolactone).

20. (new) The device of claim 1, wherein the one or more microneedles include a non-biodegradeable polymer.

21. (new) The device of claim 20, wherein the non-biodegradeable polymer is selected from polycarbonate, polymethacrylic acid, ethylenevinyl acetate, polytetrafluorethylene (TEFLON$^{TM}$), and polyesters.

22. (new) The device of claim 1, wherein the one or more microneedles are formed by a micromachining technique selected from lithography, plasma etching, wet chemical etching, dry etching, thermal oxidation of silicon, electroplating, electroless plating, boron diffusion, phosphorus diffusion, arsenic diffusion, antimony diffusion, ion implantation, film deposition, sputtering, chemical vapor deposition, epitaxy, chemical anodization, electrochemical anodization, and combinations thereof.

23. (new) A device for transporting a material across a biological barrier, comprising

a plurality of microneedles having lengths between 1 μm and 1 mm and widths between 1 μm and 500 μm;

a substrate to which the microneedles are attached, and

at least one of the microneedles having at least one groove extending in a longitudinal direction and on an exterior surface, for supporting flow of materials along the groove and across a biological barrier.

24. (new) A device according to claim 23, further comprising

a transport control mechanism for generating a voltage field gradient for

providing a force for causing the material to move across a biological barrier.

25. (new) A device according to claim 23, further comprising

a transport control mechanism for generating an ultrasonic force gradient for causing the material to move across a biological barrier.